Attorney Docket No.: 015389-002990US

Client Reference No.: 018/184C



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Cech et al.

Application No.: To be assigned

Filed: Herewith

For: Novel Telomerase

Examiner:

To Be Assigned

Art Unit:

To Be Assigned

INFORMATION DISCLOSURE

STATEMENT UNDER 37 CFR §1.97 and

§1.98

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The references cited on attached form PTO/SB/08A and PTO/SB/08B are being called to the attention of the Examiner. In accordance with 37 CFR §1.98(d), copies of references Q-S can be found in co-pending parent Application No. 09/843,676, filed April 26, 2001 (Attorney Docket no. 015389-002943US). Copies of the other references can be found in parent Application No. 08/854,050, filed May 9, 1997, now U.S. Patent No. 6,261,836 (Attorney Docket No.: 015389-002940US). If the examiner would like additional copies of these references, applicants will happily provide them.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application, and the reference be made of record therein and appear among the "references cited" on any patent to issue therefrom.

As provided for by 37 CFR 1.97(g) and (h), no inference should be made that the information and references cited are prior art merely because they are in this statement and no representation is being made that a search has been conducted or that this statement encompasses all the possible relevant information.

Cech et al.

Application No.: To be assigned

Page 2

Applicant believes that no fee is required for submission of this statement, since it is being submitted prior to the first Office Action. However, if a fee is required, the Commissioner is authorized to deduct such fee from the undersigned's Deposit Account No.

Respectfully submitted,

Hugh Wang Reg. No. 47,163

TOWNSEND and TOWNSEND and CREW LLP Two Embarcadero Center, 8<sup>th</sup> Floor San Francisco, California 94111-3834 Tel: 650-326-2400

Fax: 650-326-2422

PA 3195182 v1

PTO/SB/08B (08-00) Approved for use through 10/31/2002. OMB 0651-0031

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Page 1

Sheet

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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of

|                        | Complete if Known |  |  |  |  |  |
|------------------------|-------------------|--|--|--|--|--|
| Application Number     | To be assigned    |  |  |  |  |  |
| Filing Date            | Herewith          |  |  |  |  |  |
| First Named Inventor   | Cech, Thomas R.   |  |  |  |  |  |
| Group Art Unit         | To Be Assigned    |  |  |  |  |  |
| Examiner Name          | To Be Assigned    |  |  |  |  |  |
| Attorney Docket Number | 015389-002990US   |  |  |  |  |  |

|                        |              |  |                   | U.S. PATENT DOCU                                | MENTS  |  |
|------------------------|--------------|--|-------------------|---|--|--|
| Examiner<br>Initials * | Cite<br>No.1 | U.S. Patent Doc  Number Kind ( (if kno | Code <sup>2</sup> | Name of Patentee or Applicant of Cited Document | Date of Publication of Cited Document MM-DD-YYYY | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear |
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|                       | AD                       | PCT                 | WO 98/08938                              |                                | 02-26-98                     |  |                |  |  |  |

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| INFORMATION DISCLOSURE            | Filing Date            | Herewith          |
| STATEMENT BY APPLICANT            | First Named Inventor   | Cech, Thomas R.   |
|                                   | Group Art Unit         | To Be Assigned    |
| (use as many sheets as necessary) | Examiner Name          | To Be Assigned    |
| Sheet Page 2 of 10                | Attorney Docket Number | 015389-002990US   |

|                       | FOREIGN PATENT DOCUMENTS |                     |   |                  |                              |  |                |  |  |
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| Examiner<br>Initials* | Cita                     | For                 | reign Patent Document                                 | Name of Patentee | Date of Publication of       | Pages, Columns, Lines,<br>Where Relevant |                |  |  |
|                       | Cite<br>No. <sup>1</sup> | Office <sup>3</sup> | Number <sup>4</sup> Kind Code <sup>5</sup> (if known) |                  | Cited Document<br>MM-DD-YYYY | Passages or Relevant<br>Figures Appear   | T <sup>6</sup> |  |  |
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| Signature |  | Considered |      |

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|                            |              | OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS   | . , =          |
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| Examiner  | Date       |      |
| Signature | Considered |      |

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|            |                      |        | CLOSURE      | Filing Date            | Herewith          |  |
| STA        | <b>TEMENT B</b>      | YΑ     | PPLICANT     | First Named Inventor   | Cech, Thomas R.   |  |
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|            | (use as many she     | ets as | s necessary) | Examiner Name          | To Be Assigned    |  |
| Sheet      | Page 4               | of     | 10           | Attorney Docket Number | 015389-002990US   |  |

|                            |              | OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS   |   |
|----------------------------|--------------|---|---|
| Examin<br>er<br>Initials * | Cite<br>No.1 | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | Т |
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| Examin<br>er<br>Initials * | Cite<br>No.1 | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.      | Т |
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|                            |              | OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS   |    |
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|                            | СМ           | Kilian et al., "Isolation of a candidate human telomerase catalytic subunit gene, which reveals complex splicing patterns in different cell types," (1997) Hum. Mol. Genet., 6:2011   |    |
|                            | CN           | Kipling and Cooke, "Hypervariable ultra-long telomeres in mice," (1990) Nature 347:400  |    |
|                            | со           | Klobutcher et al., "All gene-sized DNA molecules in four species of hypotrichs have the same terminal sequence and an unusual 3' terminus," (1981) Proc. Natl. Acad. Sci., 78:3015  |    |
|                            | СР           | Koehler and Milstein, "Continuous cultures of fused cells secreting antibody of predefined specificity," (1975) Nature 256:495  |    |
|                            | cq           | Kosbor et al., "The production of monoclonal antibodies from human lymphocytes," (1983) Immunol. Today 4:72   |    |
|                            | CR           | Lamond and Sproat, (1994)"Isolation and Characterization of Ribonucleoprotein Complexes," pp103-140   |    |
|                            | cs           | Lamond et al., "Probing the structure and function of U2 snRNP with antisense oligonucleotides made of 2'-OMe RNA," (1989) Cell, 58:383   |    |
|                            | ст           | Lendvay et al., "Senescence mutants of Saccharomyces cerevisiae with a defect in telomere replication identify three additional EST genes," (1996) Genetics, 144  |    |
|                            | CU           | Lingler et al., "Purification of telomerase from Euplotes adeiculatus: requirement of a primer 3' overhang," (1996)<br>Proc. Natl. Acad. Sci., 93:10712   |    |
|                            | cv           | Lingler et al., "Reverse transcriptase motifs in the catalytic subunit of telomerase," (1997) Science, 276:561  |    |
|                            | cw           | Lingner et al., "Telomerase RNAs of different ciliates have a common secondary structure and a permuted template, " (1994) Genes Develop., 8:1984   |    |
|                            | сх           | Lingner et al., "Telomerase and DNA End Replication: No Longer a Lagging Strand Problem?," (1995) Science 269:1533  |    |
|                            | CY           | Lowy et al., "Isolation of transforming DNA: Cloning the hamster aprt gene," (1980) Cell, 22:817  |    |
|                            | CZ           | Lundblad, V. et al., "RNA-dependent polymerase motifs in EST1: tentative identification of a protein component of an essential yeast telomerase," Cell, 60 (5):29-30 (1990).  |    |
|                            | DA           | Lustig and Petes, Identification of yeast mutants with altered telomere structure," (1986) Proc. Natl. Acad. Sci., 83:1398  |    |

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|                            | DB           | Lustig, A., "The Identification of Telomerase Subunits: Catalysing Telomere Research," Trends Cell. Biol. 7:299-302 (1997).   |    |
|                            | DC           | Maddox et al., "Elevated serum levels in human pregnancy of a molecule immunochemically similar to eosinophil granule major basic protein," (1983) J. Exp. Med., 158:1211   |    |
|                            | DD           | Makarov et al., "Nucleosomal Organization of Telomere-Specific Chromatin in Rat," (1993) Cell, 73:775   |    |
|                            | DE           | McEachern and Blackburn, "runaway telomere elongation caused by telomerase RNA gene mutation," (1995) Nature, 376:403   |    |
|                            | DF           | Melby et al., "Quantitative measurement of human cytokine gene expression by polymerase chain reaction," (1993)<br>J. Immunol. Meth., 159:235   |    |
|                            | DG           | Merrifield, "Solid phase peptide synthesis. I. The synthesis of a tetrapeptide," (1963) J. Am. Chem. Soc., 85:2149  |    |
|                            | DH           | Meyerson et al., "hEST2, the Putative Human Telomerase Catalytic Subunit Gene, Is Up-Regulated in Tumor Cells and during Immortalization," (1997) Cell, 90:785  |    |
|                            | DI           | Murray, In McGraw Hill Yearbook of Science and Technology, (1992) McGraw Hill, New York NY, pp 191-196  |    |
|                            | DJ           | Nakamura et al., "Telomerase Catalytic Subunit Homologs from Fission Yeast and Human," (1997) Science, 277:955  |    |
| ·                          | DK           | Nakayama et al., "Cloning of a Candidate cDNA Encoding a Proteinaceous Component of Mammalian Telomerase," Mol. Biol. Cell. Abstracts Supp. 7 p. 286a, .sctn. 1664 (1996).  |    |
|                            | DL           | Nakayama et al., "TLP1: A Gene Encoding a Protein Component of Mammalian Telomerase Is a Novel Member of WD Repeats Family," (1997) Cell,88:875   |    |
|                            | DM           | Nielsen et al., (1993) "Peptide nucleic acids' (PNAs): Potential antisense and anti-gene agents," Anticancer Drug Des., 8:53  |    |
|                            | DN           | Oka et al., "Inverted terminal repeat sequence in the macronuclear DNA of Stylonychia pustulata, " (1980) Gene, 10:301  |    |
|                            | DO           | Olovnikov, "A theory of marginotomy: The incomplete copying of template margin in enzymic synthesis of polynucleotides and biological significance of the phenomenon," (1973) <i>J. Theor. Biol.</i> , 41:181   |    |
|                            | DP           | Orlandi et al., "Cloning immunoglobulin variable domains for expression by the polymerase chain reaction," (1989)<br>Proc. Natl. Acad. Sci., 86:3833  |    |

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|                                   | Group Art Unit         | To Be Assigned  |  |
| (use as many sheets as necessary) | Examiner Name          | To Be Assigned  |  |
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|                            | DQ           | Prescott, "The DNA of ciliated protozoa," (1994) Microbiol. Rev., 58:233  |     |
|                            | DR           | Price, (1993) Blood Rev., 7:127   |     |
|                            | DS           | Rhodes et al., "Transformation of maize by electroporation of embryos," (1995) Meth. Mol. Biol., 55:121   |     |
|                            | DT           | Roberge et al., "A strategy for a convergent synthesis of N-linked glycopeptides on a solid support," (1995) Science, 269:202   |     |
|                            | DU           | Romero and Blackburn, "A conserved secondary structure for telomerase RNA, " (1991) Cell, 67:343  |     |
|                            | DV           | Sambrook et al., Molecular Cloning, A Laboratory Manual, Cold Spring Harbor Press, Plainview NY (1989)  |     |
|                            | DW           | Sandell et al., "Transcription of yeast telomere alleviates telomere position effect without affecting chromosome stability, "(1994) Proc. Natl. Acad. Sci., 91:12061   |     |
|                            | DX           | Sanger et al., "DNA sequencing with chain-terminating inhibitors," Proc. Natl. Acad. Sci., 74:5463 [1977].  |     |
|                            | DY           | Scharf et al., "Heat stress promoters and transcription factors," (1994) Result Probl. Cell Differ. 20:125  |     |
|                            | DZ           | Shampay and Blackburn, "Generation of telomere-length heterogeneity in Saccharomyces cerevisiae," (1988) Proc. Natl. Acad. Sci., 85:534   |     |
|                            | EA           | Sheen and Levis, "Transposition of the LINE-like retrotransposon TART to <i>Drosophila</i> chromosome termini," (1994)<br><i>Proc. Natl. Acad. Sci.</i> , 91:12510  |     |
|                            | EB           | Singer and Gottschling, "TLC1: Template RNA Component of Saccharomyces cerevisiae Telomerase," (1994) Science 266:404   |     |
|                            | EC           | Singer, M., "Unusual Reverse Transcriptases," J. Biol. Chem. 270(42):24623-24626 (1995).  |     |
|                            | ED           | Starling et al., "Extensive telomere repeat arrays in mouse are hypervariable," (1990) Nucleic Acids Res., 18:6881  |     |
|                            | EE           | Swanton et al., "Arrangement of Coding and Non-coding Sequences in the DNA Molecules Coding for rRNAs in Oxytricha sp.," (1980) Chromosoma 77:203   |     |

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|                            | EF           | Tommerup et al., "Unusual chromatin in human telomeres," (1994) Mol. Cell. Biol., 14:5777   |     |
|                            | EG           | Trask, "Fluorescence in situ hybridization: application in cytogenetics and gene mapping," (1991) Trends Genet., 7:149  |     |
|                            | EH           | Verma et al., "Human Chromosomes: A Manual of Basic Techniques," Pergamon Press, New York NY (1988)   |     |
|                            | El           | Watson, "Origin of concaterment T7 DNA, " (1972) Nature New Biol., 239:197  |     |
| <del>-</del>               | EJ           | Weinrich et al., "Reconstitution of human telomerase with the template RNA component hTR and the catalytic protein subunit hTRT," (1997) Nat. Genet., 17(4):498   |     |
|                            | EK           | Wellinger et al., "Origin activation and formation of single-strand TG <sub>1.3</sub> tails occur sequentially in late S phase on a Yeast linear plasmid," (1993) Mol. Cell. Biol., 13:4057   |     |
|                            | EL           | Wellinger et al., "Saccharomyces Telomeres Acquire Single-Strand TG <sub>1.3</sub> Tails Late in S Phase," (1993) Cell 72:51  |     |
|                            | ЕМ           | Whitehead Institute/MIT Center for Genome Research, Genetic Map of the Mouse, Database Release 10, APril 28, 1995   |     |
|                            | EN           | Wigler et al., "Transfer of purified herpes virus thymidine kinase gene to cultured mouse cells," (1977) Cell, 11:223   |     |
|                            | EO           | Wigler et al., "Transformation of mammalian cells with an amplifiable dominant-acting gene," (1980) Proc. Natl. Acad. Sci., 77:3567   |     |
|                            | EP           | Winter and Milstein, "Man-made antibodies," (1991) Nature, 349:293  |     |
|                            | EQ           | Wright et al., "Saccharomyces telomeres assume a non-nucleosomal chromatin structure, " (1992) Genes Develop., 6:197  |     |
| . •                        | ER           | Yu et al., "In vivo alteration of telomere sequences and senescence caused by mutated Tetrahymena telomerase RNAs," (1990) Nature, 344:126  |     |
|                            | ES           | Zahler and Prescott, "Telomere terminal transferase activity in the hypotrichous ciliate Oxytricha nova and a model for replication of the ends of linear DNA molecules," (1988) Nucleic Acids Res., 16:6953  |     |
|                            | EΤ           | Zakian, Telomeres: Beginning to Understand the End," (1995) Science 270:1601  |     |

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|   | EU           | Zaug et al., "Catalysis of RNA Cleavage by a Ribozyme Derived from the Group I Intron of Anabaena Pre-tRNA <sup>Leu</sup> ,"  |    |  |  |  |  |
|   | EV           | Zaug, A. J. et al., "Method for determining RNA 3' ends and application to human telomerase RNA," Nucleic Acids Research, 24 (3): 532-533 (1996).   |    |  |  |  |  |

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